

WHAT WORKS?

Research into Practice

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Research Monograph # 13

How can we teach content literacy to elementary students?

Research Tells Us

- Content literacy helps students to read and write effectively, understand and reason about content area concepts, and become more engaged in literacy and content subjects.
- Teaching reading comprehension strategies increases students' learning from informational text.
- Metacognitive (reflective) learning log entries help students to learn about subjects such as science, social studies and math.
- After reading, creating a concept map increases learning.
- Translating information from one form, such as a text, into another form, such as a diagram, increases learning.

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Content Literacy

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Content literacy is the ability to read, write, create, interpret and present a range of media, in subjects such as science, social studies and mathematics. It includes the use of informational text, that is, print and electronic media that present factual and conceptual content.¹ Content literacy is essential for success in both secondary and post-secondary education, where most of what students read will be non-fiction. Fortunately, developing content literacy can draw on students' authentic interests in the world around them.²

Challenges for Elementary Students

If students are not familiar with informational text forms, such as persuasive and explanatory writing, content literacy is more of a challenge.³ These texts include vocabulary and technical concepts that are abstract and impersonal. Most are densely written, presenting several concepts in every sentence. Additionally, some content reading takes place on the Internet, which is especially difficult for younger students to search and select material from effectively.⁴

Teachers can address these challenges by helping students acquire skills in reading and writing informational text and developing their content literacy. Content literacy is beneficial for a diverse range of students, including English language learners⁵ and students with special learning needs.⁶ Content literacy helps students to read and write effectively, understand and reason about content area concepts and become more engaged in literacy and content subjects.^{7, 8, 9}

Learning How to Read Informational Texts

To support content reading in the curriculum, teachers need to balance the use of different kinds of texts in their classroom programs: informational texts, narratives and other types of reading materials.¹⁰ If teachers read aloud to students from

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Tips for Classroom Practice

- Balance fiction with non-fiction reading materials.
- Use informational text for activities such as reading aloud, self-selected reading, guided reading and literature circles.
- Use real-life observations and hands-on experiments as bases for writing and reading.
- Teach students strategies for comprehending informational text
- Use learning logs in subjects such as science, social studies and mathematics.
- Teach students how to write informational texts, such as reports, procedures (instructions), arguments (persuasion) and explanations.
- Have students write a variety of kinds of texts in science and social studies.

informational texts, then most students will begin to select them more often for their own reading.¹¹ Students' interests can also be increased by combining reading with hands-on investigation; they learn more from this combination than from either reading or hands-on activities alone.¹² Authentic reading and writing activities increase students' ability to comprehend informational texts.⁹ These activities have *authentic purposes* important to the learner, and use *authentic texts* written for a purpose beyond simply teaching literacy skills.

Teachers can prepare students to read non-fiction by asking them what they would like to learn about a topic, to share what they already know, to make predictions about what they will find in the text and to pose their own questions. They can guide students to "question the author," using queries such as, "What is the author trying to say? What does the author want us to know? Why is the author telling us that now? What has the author added here that fits in with _____?"¹³ This helps students to think of the text as one written by a real person who is trying to communicate a specific message. Students' learning increases if they respond to a text by creating a product of their own, such as a learning log entry or a concept map (mind map).¹⁴

The goal for students is to understand informational text independently. Good readers do this by using strategies.¹⁵ Before reading difficult texts, they set goals for reading by asking questions about the topic. They make predictions about what they will find in the text and skim through it in order to become familiar with its structure. They purposefully try to picture what they are reading in their imagination, select key ideas and compare their predictions to the text. As they read, they ask themselves whether they understand the material, and if they do not, they reread and apply new strategies. After reading, they may summarize the text for themselves and evaluate it critically.

Teaching these strategies can help most students to read informational text with greater comprehension.¹⁶ Initially, the teacher can explain the strategy to students and model it for them while reading aloud. It is important to emphasize that the purpose of the strategy is to help the reader understand the text; it is not an "extra" task. During guided reading, the teacher can invite students to apply the strategy, while providing support and feedback. Strategy use can also be supported with tangible prompts. For example, as students in one project read about the decline of frogs, they created a think sheet with two columns: in the first column, titled "Notes," they jotted down points from the reading; in the second column, titled "Thinking," they jotted down their questions and thoughts about each point.¹⁷ Students can practise comprehension strategies with a partner or small group. Eventually, they can do so independently.

A special challenge arises when students have misconceptions about content which can lead them to misinterpret the new material that they read. Simply being presented with the correct explanation is usually not effective; instead, students need to read texts and have experiences that confront their prior beliefs directly.¹⁸

Learning How to Write Non-Fiction

When the goal of writing is to help students understand subject matter, an appropriate type of text is the learning log, a journal in which students write informally about what they are learning. A learning log is most effective if teachers provide metacognitive questions, which prompt students to think reflectively, e.g., "What have I learned? What questions do I still have about this topic? For me, the most important ideas in today's lesson/reading were _____."¹⁹ Learning logs are most effective if students write in them briefly (less than 10 minutes), three to four times per week, for at least a term.



Students also need to learn to write informational texts.²⁰ Brief reports and procedural texts (instructions) are popular forms for the upper primary grades, but they should be introduced earlier through read-alouds to build students' engagement and familiarity with informational text. Persuasive texts, in which students state their opinions and give reasons for them, invite critical thinking about subject matter. For upper elementary students, the traditional science experiment report, with its question, method, observations and conclusion, can be enriched with questions that generate deeper understanding, e.g., "*How do I know? How do my ideas compare with others' ideas? How have my ideas changed?*"²¹ Some educators have experimented with introducing creative forms of writing into content subjects, including imaginative stories, raps and skits.²² These appear promising, but more research is needed to investigate whether they contribute significantly to students' learning.

Teachers can help students learn to write in new forms through authentic activities in which they communicate something to an audience that wants or needs the information.⁹ For example, in one project, Grade 3 students visited a nature centre; later, a guide asked the class to create a brochure for future visitors. Students can learn to write informational texts through a sequence that begins with strong teacher support, followed by a gradual transfer of responsibility to students. Activities can include: the teacher reading aloud; students reading texts and discussing their special features; the teacher modelling reading and writing for students; the teacher writing together with the class; students writing with support from a partner; and students writing independently.²⁰ Most studies show that writing instruction is most effective when teachers present writing strategies explicitly to students,²³ although there are exceptions to this finding.⁹

Multiple Literacies

To become literate in the content areas, students need to become adept oral communicators and to work with a variety of representations, including graphics and electronic media. Through teacher-led discussions, primary children have successfully learned to use talk to reason about subjects such as science.²⁴ This includes students expressing their ideas, giving reasons and disagreeing politely with others. Talking about a topic helps students, particularly when they are not doing well in a subject, to write and learn more effectively.²⁵

Graphics such as diagrams, graphs and tables are important tools for developing content literacy. They can make abstract activities such as comparing and contrasting visible to students. When students learn how to create graphics, this opens up new possibilities for learning; some studies have shown that students learn more effectively when they translate ideas from one form into another. For example, students learned more when they read an explanation about how a volcano works and then created a diagram based on it, than when they read the explanation, and then wrote an explanation of their own.²⁶

Electronic media also open up new possibilities for content area learning. The Internet can support active investigations such as WebQuests (<http://www.webquest.org>).²⁷ In WebQuests, students research a topic, and then use the resulting information to construct a new product of their own. For example, students could choose an animal and research it online, then use the information to design a habitat for a zoo. Internet investigations for elementary students require careful vetting of websites. If computer resources are limited, teachers can print selected web pages in advance. Most activities involving electronic literacy have strong anecdotal support; further research is required to understand and validate effectiveness for learning.

In Sum: Educators can begin to implement content literacy by making changes within the framework of the classroom program. See "Tips for Classroom Practice" (page 2 sidebar).



Classroom Research Communities

In these programs, the teacher reorganizes the classroom as if it were a community of researchers, encouraging students to read, write and think like young historians and scientists.^{7, 28}

These programs encourage students to:

- pose their own questions
- investigate a few important concepts deeply, rather than touching on a larger number of concepts superficially
- learn about the ways in which adults read texts in specific disciplines (e.g., how historians read primary sources critically)

Classroom research communities encourage students to:

- collaborate to carry out investigations in which they learn how to reason in a subject (e.g., how to use science experiments to test hypotheses)
- use writing and other media to share their initial ideas with classmates and receive feedback
- present their conclusions to their classmates and other audiences.

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